

## Palmyra Atoll NWR Monthly Report January 2002

### A. HIGHLIGHTS

- ◆ On 01 January the first Sooty Tern eggs hatch on the Short Fighter Strip.
- ◆ On 01 January started collecting DNA/blood samples for Dr. David Anderson.
- ◆ On 06 January the plane arrives with 11 people and departs on 09 January with 10.
- ◆ On 11 January started the BRBO/MABO MIC survey and completed it on 16 January.
- ◆ On 11 January an adult Red-billed Tropicbird was seen over Dudley Island.
- ◆ On 22 January conducted the RFBO MIC survey.

### B. WEATHER

Rainfall total for January 2002 was 17.26 inches. Only 2 days were recorded with zero rainfall. Average maximum sun temperature was 32°C and the average minimum sun temperature was 24.5°C. Average maximum shade temperature was 30.12°C and the average minimum shade temperature was 23.8°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly. Average cloud cover during the sample period was 70% (range 15-100%).

### C. RESEARCH AND MONITORING

The MIC for Great Frigatebirds was conducted on 08 January 2002. The results are listed below.

LOCATION	# BIRDS ON NEST	# OF CHICKS
Papala Island	0	9
Lost Island	0	9
Frigate Island	0	6
Middle Island	0	13

The Brown Booby (BRBO)/Masked Booby (MABO) mean incubation count survey (MIC) started on 11 January 2002 and was completed on 16 January 2002. A total of 404 active BRBO sites were visited and 13 MABO sites. Considering the previously fledged chicks that were not included in this count the atoll population could be as high as 600 pair.

The Red-footed Booby (RFBO) MIC was conducted on 22 January 2002. Ainsley Island, the Paradise Island causeway and the main section of the North/south causeway were sampled again yielding a total of 267 eggs were found compared to only 8 eggs found during the last survey.

The vegetative assessment of the atoll continued through the month. The Cooper Island Complex (excluding Aviation Island) was completed as well Dudley, Leslie and most of Sand Island.

The turtle count was not conducted this month.

#### **D. ADMINISTRATION**

##### **1. Personnel**

###### **a. FWS Personnel**

Biologist Depkin was on station the entire month of January.

###### **b. TNC Personnel**

TNC personnel on island this month were John Hill and Chryssi Mitchell (departed 09 January 2002) and Matt and Elizabeth Lang (arrived 06 January 2002)

###### **c. FWS Volunteers**

**NTR**

###### **d. TNC Volunteers**

TNC volunteer Clare Patterson departed on the 09 January 2002 flight, replaced by Barb and Don Moore. The Moores remained on island the remainder of the month.

###### **e. Others**

Communications experts Ric Ching, Kimo Chun and Pat Guerin were on island from 06 January departing on 09 January as were Tim Ball and Christine Holz who were here to install equipment to assess solar and wind potential for alternate power sources. Morris Takushi also arrives (employed by Strategic Solutions) to look at areas like the Black Lagoon for possible bio-remediation.

###### **f. Arrivals and Departures**

On 06 January 2002-Charter G1: Arrives with personnel and cargo. Departs on 09 January 2002.

On 29 January 2002- S/V Sailors Run: Arrives with 2 POB. They departed on 12 February 2002.

g. Safety

NTR

## HABITAT MANAGEMENT

### a. Habitat Restoration or Modification

Clearing and maintenance on the Short Fighter Strip was suspended due to Sooty Tern nesting activity.

The rat crew continues to maintain rat lanes across the atoll.

### b. Contaminates

Morris Takushi from Strategic Solutions visited the atoll from 06 January through 09 January 2002. His primary objective was to visit the Hospital Dump site and inspect it with the thought of bio-remediation in mind. After inspecting the site he realized the improbability of that option. He also look for potential sites for a waste water treatment system.

### c. Bird Aircraft Strike Management

New nesting of Sooty Terns slowed by the end of the month. Hazing continues during daylight hours to keep all sooties off of the active runway.

## WILDLIFE

### a. Endangered and Threatened Species

NTR

### b. Waterfowl

NTR

### c. Marsh and Water Birds

NTR

d. Shorebirds, Gulls, Terns and Allied Species

1. **Wedge-tailed Shearwater**

NTR

2. **Red-tailed Tropicbird**

Present on the atoll.

3. **White-tailed Tropicbird**

Present on the atoll.

4. **Masked Booby**

Collected blood samples for DNA assessment.

5. **Brown Booby**

Collected blood samples for DNA assessment.

6. **Red-footed Booby**

Collected blood samples for DNA assessment. Increased nesting activity observed.

7. **Great Frigatebird**

Conducted MIC on 08 January. See Section "C".

8. **Lesser Frigatebird**

Three male Lesser Frigatebirds were seen in flight over the Middle Lagoon on 12 January.

9. **Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

10. **Sooty Tern**

Sooty Tern eggs started to hatch this month in all locations. Egg laying to a stop by the end of the month.

Sooty Tern hazing continued through out the month. The run-out area beyond the end of the active runway was given over to nesting as was the apron east of the 1000 foot mark. Some Sooty mortality was observed and most was believed to be related to mid-air collisions.

Sooty Tern eggs were moved from the active when found and the majority of those found were unattended and cold.

**11. Brown Noddy**

Present on the atoll.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

Present on the atoll.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

Present on the atoll.

**17. Ruddy Turnstone**

Present on the atoll.

**e. Raptors**

NTR

**f. Other Migratory Birds**

One adult Red-billed Tropicbird was seen in flight over Dudley Island. It was with several Red-tailed Tropicbirds and attempted to land on Dudley several times. It was never seen landing and it was not seen on subsequent days.

f. **Marine Mammals**

As many as 30 spinner dolphins were seen during a blue water trip on 29 January 2002.

g. **Fisheries Resources**

NTR

h. **Scientific Collection**

At the request of Dr. Dan J. Anderson, from Wake Forest University, FWS personnel aided by TNC personnel Chryssi Mitchell, collected 32 blood samples each from Red-footed and Brown Booby chicks. Only 2 samples were collected from Masked Booby chicks. Samples were collected to aid Dr. Anderson with his genetics studies of these species. The sampling for red-foots and browns are completed but will continue to collect samples from Masked Booby chicks.

i. **Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. There was a crew change this month as Clare Patterson went off island as Barb and Don Moore came on as her replacement. The program continues on a maintenance schedule.

j. **Marking and Banding**

During the month of January 3 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Masked Booby	1	0
Brown Booby	32	0
Red-footed Booby	34	0

k. **Disease Control and Prevention**1. **Oiled Bird Sighting**

NTR

2. **Other**

NTR

**D. PUBLIC USE**

**a. Visiting Yachts**

The S/V Sailors Run arrived on 29 January with 2 POB. They were on their way to Canton. They requested permission to stay beyond the 7 day limit and after agreeing to certain conditions, were granted permission by FWS personnel.

**b. Client Groups**

NTR

**c. Other**

NTR

**d. Law Enforcement**

NTR

**E. EQUIPMENT AND FACILITIES**

**a. General**

NTR

**b. Communications Systems**

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report  
February 2002**

**A. HIGHLIGHTS**

- ◆ Shorebird counts are continued after a 2 month hiatus due to nesting Sooty Terns.
- ◆ On 01 February conducted the turtle survey.
- ◆ On 11 February conducted the Red-tailed Tropicbird survey.
- ◆ After observing rat sign in several locations this month it was decided to conduct a random sample of the rat population through live trapping. The results indicated that a reproductively active population existed on the Cooper Island Complex. Measures were taken.
- ◆ On 24 February started the Brown/Masked Booby survey.
- ◆ Vegetation sampling continued through the month.

**B. WEATHER**

Rainfall total for February 2002 was 11.62 inches. Only 3 days were recorded with zero rainfall. Average maximum sun temperature was 32.1°C and the average minimum sun temperature was 24.3°C. Average maximum shade temperature was 30.5°C and the average minimum shade temperature was 23.7°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly. Average cloud cover during the sample period was 70% (range 1-100%).

**C. RESEARCH AND MONITORING**

The turtle count was conducted on 01 February 2002 in the 3 locations reported previously. No distinction was made between species. Surveys were conducted at midday to reduce glare. The TNC off shore boat was anchored and observation were made from the roof. Observation periods were 15 min. and the observer surveyed 360 degrees. Notes were made on wind speed, cloud cover and general viewing conditions. Latitude and Longitude were recorded for each anchor location. Locations of sightings were mapped and assigned a time and size class to help keep track of individuals. The first location was at the mid-point between the west end of the Short Fight Strip and the Cooper Island Dolphins. A total of 5 turtles were seen there. The second location was on the west edge of the Center Lagoon where a total of 11 turtles were seen. The third location at the west end of the ship channel 12 turtles were observed for a total of 28 turtles.



Four shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone	Pectoral Sandpiper	Sharp-tailed Sandpiper	Sanderling
04 Feb 2002	0715	49	11	0	0	0	0	0
11 Feb 2002	0715	45	12	0	0	0	0	0
18 Feb 2002	0715	44	18	1	0	0	0	0
26 Feb 2002	0710	45	8	0	0	0	0	0

The Red-tailed Tropicbird Mean Incubation Count survey (MIC) was conducted on 11 February 2002. By the end of the month 82 sites had been found although not all of those were active.

The Brown Booby (BRBO)/Masked Booby (MABO) MIC started on 24 February 2002 and was completed on 26 February 2002. A total of 440 active BRBO sites were visited and 17 MABO sites. Initially it was thought that the population of Brown Boobies was at or below 250 pair and it was based on the information that it was decided to follow each individual nest through fledge or fail. Considering that the population is closer to 600 pair it was decided to modify the methods to reduce time spent in the colony. Starting with this survey it is now conducted as a simple walk through survey, recording the stage of each nest but not marking individual nest sites.

The vegetative assessment of the atoll continued through the month.

#### **D. ADMINISTRATION**

##### **1. Personnel**

###### **a. FWS Personnel**

Biologist Depkin was on station the entire month of January.

###### **b. TNC Personnel**

TNC personnel on island this month Matt and Elizabeth Lang.

###### **c. FWS Volunteers**

NTR

###### **d. TNC Volunteers**

TNC volunteers Barb and Don Moore were on island the entire month.

###### **e. Others**

NTR

**f. Arrivals and Departures**

On 29 January 2002- S/V Sailors Run: Arrives with 2 POB. They departed on 12 February 2002.

**g. Safety**

NTR

**HABITAT MANAGEMENT**

**a. Habitat Restoration or Modification**

Clearing and maintenance on the Short Fighter Strip was suspended due to Sooty Tern nesting activity.

On 07 Feb 2002 rat scat was discovered in several different locations on Aviation Island. Further investigation revealed scat in a number of other locations as well. This prompted us to sample separately each section of the Cooper Island Complex using live traps at randomly selected stations. The results in number and in age/sex distribution indicated a population of reproductively active rats.

We believe that the population rebounded for several different reasons. The first is that ground baiting on Palmyra has been problematic from the beginning due to competition from both species of hermit crabs and coconut crabs. Apparently both hermit crabs and coconut crabs can consume the bait block and suffer no harm. It did not take them long to find the bait. Often bait is placed at a station and from the time it takes to walk back from one end (several minutes) of the transect hermit crabs are already at the stations. The other reason the population came back, which may have made no difference until a way was found to exclude the hermit crabs, was that the atoll was placed on a maintenance schedule too early.

After we felt enough information was in concerning the rat population and the need to modify the stations we started to experiment with different designs. Elevated bait stations, bait tubes with end caps and bucket stations were tested using live rats in a control setting. Rats had no problem getting into the plastic bucket with a 1.5 inch hole drilled 8 inches up the side. They also had no problem getting into the capped tubes or the raised platform which was about 10 inches high.

**b. Contaminates**

NTR

c. **Bird Aircraft Strike Management**

Some of the Sooty Terns chicks were starting to fledge by the end of the month from the Short Fighter Strip. Hazing tapered off by the end of the month.

**WILDLIFE**

a. **Endangered and Threatened Species**

NTR

b. **Waterfowl**

NTR

c. **Marsh and Water Birds**

NTR

d. **Shorebirds, Gulls, Terns and Allied Species**

1. **Wedge-tailed Shearwater**

NTR

2. **Red-tailed Tropicbird**

Present on the atoll.

3. **White-tailed Tropicbird**

Present on the atoll.

4. **Masked Booby**

Present on the atoll.

5. **Brown Booby**

Present on the atoll.

6. **Red-footed Booby**

Present on the atoll.

**7. Great Frigatebird**

Present on the atoll.

**8. Lesser Frigatebird**

Two Lesser Frigatebirds were seen in flight over the west end of the main ship channel on 01 February 2002.

**9. Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

**10. Sooty Tern**

Sooty Tern eggs finished hatching and some chicks from the Short Fighter Strip started to fledge.

**11. Brown Noddy**

Present on the atoll.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

Present on the atoll.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

Present on the atoll.

**17. Ruddy Turnstone**

Present on the atoll.

e. Raptors

NTR

f. Other Migratory Birds

NTR

f. Marine Mammals

Bottlenose dolphins were reported twice for the month of February 2002 in groups of greater than 30 and 6.

g. Fisheries Resources

NTR

h. Scientific Collection

NTR

i. Animal Control

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. Barb and Don Moore were on island all month working to retrofit stations and maintain the rat lanes.

j. Marking and Banding

During the month of January 2 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Masked Booby	7	0
Brown Booby	82	0

k. Disease Control and Prevention

1. Oiled Bird Sighting

NTR

2. Other

NTR

**D. PUBLIC USE**

**a. Visiting Yachts**

The S/V Sailors Run arrived on 29 January with 2 POB. They were on their way to Canton. They requested permission to stay beyond the 7 day limit and after agreeing to certain conditions, were granted permission by FWS personnel. They departed on 12 February 2002.

**b. Client Groups**

NTR

**c. Other**

NTR

**d. Law Enforcement**

NTR

**E. EQUIPMENT AND FACILITIES**

**a. General**

NTR

**b. Communications Systems**

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report  
March 2002**

**A. HIGHLIGHTS**

- ◆ On 05 March the tug American Islander arrives with fuel and supplies.
- ◆ On 06 March conducted the Great Frigatebird Mean Incubation Count survey (MIC).
- ◆ On 07 G1 charter arrives with First Response medical trainer and two new rat crew volunteers.
- ◆ On 07 conducted the Red-footed Booby MIC.
- ◆ On 12 March FWS personnel Depkin departs for work related reasons.
- ◆ On 12 March R/V Townsend Cromwell arrives to conduct surveys and to deploy a remote weather buoy.
- ◆ On 18 March UXO Army and Navy personnel arrive on a Coast Guard C-130.
- ◆ On 24 March FWS personnel Depkin returns on G1 charter with TNC client group.
- ◆ On 27 and 28 March conducted the Red-tailed Tropicbird MIC.
- ◆ On 29 March collected scale samples from several different locations around the atoll with concerns about its affect on the Pisonia trees.

**B. WEATHER**

Rainfall total for March 2002 was 13.03 inches. Only 3 days were recorded with zero rainfall. Average maximum sun temperature was 32.1°C and the average minimum sun temperature was 24.5°C. Average maximum/minimum shade temperatures were not available this month. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly. Average cloud cover during the sample period was 65% (range 15-100%).

**C. RESEARCH AND MONITORING**

The turtle count was not conducted this month.

Only one shorebird count was conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone
05 Mar 2002	0715	42	8	0	0

The Great Frigatebird MIC was conducted on 06 March. One new area was added this count.

LOCATION	# BIRDS ON NEST	# OF CHICKS	# COURTING MALES
Papala Island	7	4	16
Lost Island	0	0	14
Frigate Island	20	0	22
Middle Island	8	0	23
Eastern Island	22	0	24

The Red-footed Booby MIC was conducted on 07 March 2002 with the results listed below with those of the previous 4 surveys. All of the 3 sub-sampled areas were lumped together.

DATES	# OF EGGS	# OF CHICKS	# TOTAL SITES
06 SEPT 2001	247	79	326
23 OCT 2001	30	146	176
07 DEC 2001	8	111	119
22 JAN 2002	271	60	331
07 MAR 2002	92	162	254

The Red-tailed Tropicbird Mean Incubation Count survey (MIC) was conducted on 27 and 28 March 2002. A total of 31 new sites were found during the survey and the total number of sites found to date are 113.

Special Use Permits were issued to Dr. Russell Brainard (12521-02012) and Dr. Jean Kenyon (12521-02009) to cover their research activities in all of the refuge lands, including Palmyra Atoll NWR while onboard the R/V Townsend Cromwell from 21 January 21 to 31 March 2002.

## **D. ADMINISTRATION**

### **1. Personnel**

#### **a. FWS Personnel**

Biologist Depkin was on station from 01 March until departing on 12 March and returning on 26 March 2002.

#### **b. TNC Personnel**



TNC personnel on island all month were Matt and Elizabeth Lang, John Hill and Chryssi Mitchell. On 26 March 2002 the following TNC personnel arrive with a client group and depart on 30 March 2002: Chuck Cook, Nancy Mackinnon, Todd Calitri and Kevin Faucheux.

**c. FWS Volunteers**

**NTR**

**d. TNC Volunteers**

TNC volunteers Steve and Cathy Fairchild arrived on 07 March 2002 and stayed through the month. George Taylor arrives on the 26 March 2002 flight and remains on island the rest of the month. Barb and Don Moore departed the atoll on 30 March 2002.

**e. Others**

Members of the Explosive Ordnance Disposal (EOD) team, USN DCCM Thomas A. Bourque, USN HT1 Scott C. Vlcek, USA SSG Bryan Mills, USA SGT Michael Brady and USN LT medical doctor Geoffrey S. Keenan, were here from 18 March until 24 March 2002

**f. Arrivals and Departures**

On 04 March 2002 -Tug American Islander: Arrives with fuel and supplies departing the next day.

On 07 March 2002- G1 charter: Arrives with Pat Guerin, Gary Matsushima, Steve and Kathy Fairchild and the First Response medical trainer, departing on 12 March 2002 with Pat Guerin, the First Response medical trainer and Chris Depkin.

On 07 March 2002-R/V Townsend Cromwell: Arrives to conduct survey work and to deploy a remote weather buoy. They depart the area on 13 March 2002.

On 18 March 2002 -Coast Guard C-130: Arrives with UXO personnel USN DCCM Thomas A. Bourque, USN HT1 Scott C. Vlcek, USA SSG Bryan Mills, USA SGT Michael Brady and USN LT medical doctor Geoffrey S. Keenan. The C-130 departs the same day.

On 24 March 2002 -Coast Guard C-130: Arrives with cargo and departs the same day with UXO personnel and Gary Matsushima who had been injured during a fishing trip.

On 26 March 2002- G1 Charter: Arrives with a client group departing on 30 March 2002.

g. **Safety**

On 20 March 2002 during UXO operations all non-essential personnel departed Cooper Island during detonation of charges.

On 22 March 2002 TNC boat captain Gary Matsushima injured his hand during a fishing trip and was taken off island on 24 March 2002 by Coast Guard C-130.

**HABITAT MANAGEMENT**

a. **Habitat Restoration or Modification**

Clearing and maintenance on the Short Fighter Strip was suspended due to Sooty Tern nesting activity.

The retrofitting of rat bait stations continued through the month.

b. **Contaminates**

The Exploded Ordinance Disposal (EOD) team was here this month to inspect and destroy old military ordinance. One of the old magazines on Cooper Island contained old degraded explosives some of which were not possible to identify. It was decided to use dunage and diesel fuel to burn what was left of the old ordinance. The burn proved to be less effective than hoped so the remains of the ordinance was moved to a different location where a total of 695 lbs. of explosives were used to finish the job. FWS personnel were off away from the atoll so TNC personnel Matt Lang inspected affected areas both before and after burns and explosions for impacts to wildlife. With the exception of one minor injury to a Red-footed Booby there were no reports of seabird mortality.

The EOD team also visited Barren Island where they found 7 M1 A1 land mines which were transported to the northern tip of the island for disposal. After inspecting the site for wildlife the mines were detonated. No impacts to wildlife were reported.

The EOD team also visited the Hospital Dump Site (Black Lagoon). No live ordinance was found at this site but no excavation was attempted.

In the final remarks of Incident Report 3265, control # MP-21-02, the following comments were made;

“Barren Island - It is highly likely that many more mines exist on the islands interior off of the established trails. It is recommended that TNC personnel do not establish any new trails on the island and stick to the established routes for their safety. Any attempt to clear the island of all land mines and additional ordnance items would probably have an impact on the environment. The plant growth on the island is extremely thick and would have to be cleared to be able to effectively sweep the island for ordnance items. The EOD techs re-inspected the established trails on the island for any visual signs of additional land mines and found none.”

“Cooper Island – All known ordnance items were destroyed with the completion of this operation. No further work is expected.”

“Black Lagoon – This is a dump site that if cleaned up should require an EOD presence (either civilian type or military) to identify and dispose of any ordnance items that may be excavated.”

c. **Bird Aircraft Strike Management**

Some of the Sooty Terns chicks were starting to fledge by the end of the month from the Short Fighter Strip. Hazing tapered off by the end of the month.

**WILDLIFE**

a. **Endangered and Threatened Species**

NTR

b. **Waterfowl**

NTR

c. **Marsh and Water Birds**

NTR

d. **Shorebirds, Gulls, Terns and Allied Species**

1. **Wedge-tailed Shearwater**

One heard vocalizing over camp on the night of 03 March 2002.

2. **Red-tailed Tropicbird**

Present on the atoll. The MIC for this species was conducted this month see section "C".

**3. White-tailed Tropicbird**

Present on the atoll.

**4. Masked Booby**

Present on the atoll.

**5. Brown Booby**

Present on the atoll.

**6. Red-footed Booby**

Present on the atoll. The MIC for this species was conducted this month see section "C".

**7. Great Frigatebird**

Present on the atoll. The MIC for this species was conducted this month see section "C".

**8. Lesser Frigatebird**

Seen west of the atoll around the end of the month.

**9. Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

**10. Sooty Tern**

Sooty Tern eggs finished hatching and some chicks from the Short Fighter Strip started to fledge.

**11. Brown Noddy**

Present on the atoll.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

Present on the atoll.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

Present on the atoll.

**17. Ruddy Turnstone**

Present on the atoll.

**e. Raptors**

NTR

**f. Other Migratory Birds**

One Lesser Yellowlegs seen on 29 March in the Milky Way.

**f. Marine Mammals**

NTR

**g. Fisheries Resources**

A total of 17 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
07 March 2002	Yellow Fin Tuna	24	119	
10 March 2002	Ono	50	177	
10 March 2002	Yellow Fin Tuna	7.5	80	
14 March 2002	Yellow Fin Tuna	12.7	91	
14 March 2002	Yellow Fin Tuna	19.5	104	
14 March 2002	Yellow Fin Tuna	22.7	114	
14 March 2002	Yellow Fin Tuna	15	97	

14 March 2002	Yellow Fin Tuna	10.9	89	
14 March 2002	Yellow Fin Tuna	11.22	91	
22 March 2002	Yellow Fin Tuna	21.09	110	
22 March 2002	Ono	8.8	118	
23 March 2002	Yellow Fin Tuna	15.9	102	
23 March 2002	Yellow Fin Tuna	15	100	
23 March 2002	Yellow Fin Tuna	18.63	107	
28 March 2002	Yellow Fin Tuna	14.13	98	
28 March 2002	Yellow Fin Tuna	9.04	85	
28 March 2002	Yellow Fin Tuna	8.5	82	

1. kilograms
2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

#### **h. Scientific Collection**

Biologist Depkin collected the insect pest scale spp. from several different location around the atoll. Samples were taken from Pisonia trees due to concerns that the infestation is heavy enough on some trees that mortality might occur. Samples were sent to Honolulu where we hope that they are identified. Knowing the species may give us a better idea as to how to handle this problem.

#### **i. Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. Barb and Don Moore departed on the 30 March flight and were replaced by Steve and Kathy Fairchild who arrived on 07 March 2002 and stay on island the rest of the month.

#### **j. Marking and Banding**

During the month of January 2 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	21	25
Brown Booby	20	0

#### **k. Disease Control and Prevention**

##### **1. Oiled Bird Sighting**

NTR

2. Other

NTR

D. PUBLIC USE

a. Visiting Yachts

NTR

b. Client Groups

One TNC client group visited the atoll this month arriving on 26 March and departing on 30 March 2002. Activities include fly fishing for bonefish, snorkeling, blue water fishing and natural history tours.

c. Other

NTR

d. Law Enforcement

NTR

E. EQUIPMENT AND FACILITIES

a. General

NTR

b. Communications Systems

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report  
April 2002**

**A. HIGHLIGHTS**

- ◆ On 03 April started clearing a test area on Menge Island as an alternate nesting site for Sooty Terns.
- ◆ On 09 April the Student Sailing Vessel Robert C. Seamans arrives with students and crew for a 3 day stay.
- ◆ On 12 April started the Brown/Masked Booby Mean Incubation Count survey (MIC).
- ◆ On 16 April an adult Franklin's Gull was seen on the runway.
- ◆ Toward the end of the month a small mortality event was observed in adult Red-footed Boobies. Several were sent off for analysis.
- ◆ On 23 April G1 chartered arrives with 3 researchers here to investigate the bonefish population. A representative from NOAA also arrived in an attempt to fix the newly installed remote weather buoy.
- ◆ On 24 April conducted the Red-footed Bobby MIC.
- ◆ On 29 April the G1 charter arrives with a TNC client group. They departed on 03 May.

**B. WEATHER**

Rainfall total for April 2002 was 17.38 inches. Only 5 days were recorded with zero rainfall. Average maximum sun temperature was 33°C and the average minimum sun temperature was 24.7°C. Average maximum shade temperature was 30.9°C and the minimum shade temperature was 24.5°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly. Average cloud cover during the sample period was 71% (range 1-100%).

**C. RESEARCH AND MONITORING**

The turtle count was conducted on 04 April 2002 in the 3 locations reported previously. No distinction was made between species. Surveys were conducted at midday to reduce glare. The TNC off shore boat was anchored and observation were made from the roof. Observation periods were 15 min. and the observer surveyed 360 degrees. Notes were



made on wind speed, cloud cover and general viewing conditions. Latitude and Longitude were recorded for each anchor location. Locations of sightings were mapped and assigned a time and size class to help keep track of individuals. The first location was at the mid-point between the west end of the Short Fight Strip and the Cooper Island Dolphins. A total of 7 turtles were seen. The second location was on the west edge of the Center Lagoon where a total of 8 turtles were seen. The third location at the west end of the ship channel 12 turtles were observed for a total of 27 turtles seen.

Five shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone
02 Apr 2002	0705	62	8	1	0
09 Apr 2002	0705	54	15	1	0
16 Apr 2002	0700	50	19	4	1
23 Apr 2002	0700	28	18	0	0
30 Apr 2002	0655	5	12	0	1

The Brown/Masked Booby MIC was conducted from 13 April through 15 April 2002. A total of 379 active Brown Booby sites (143 eggs and 236 chicks) and 16 active Masked Booby sites (2 eggs and 14 chicks) were surveyed.

On 24 April 2002 the Red-footed Bobby MIC was conducted. The results are listed below along with the results of previous surveys.

DATES	# OF EGGS	# OF CHICKS	# TOTAL SITES
06 Sep 2001	247	79	326
23 Oct 2001	30	146	176
07 Dec 2001	8	111	119
22 Jan 2002	271	60	331
07 Mar 2002	92	162	254
24 Apr 2002	235	217	452

On 23 April 2002 Researchers Dr. Alan M. Friedlander, Dr. Jim Beets and Dr. Beeing M. Yeeting (SUP# 12521-02017) arrive to begin their investigations into the bonefish population at Palmyra. Some concern was expressed to the bonefish researchers by Refuge Manager Depkin over the lack of detail in the proposal in the area of collecting and the method to be employed. Concern was also expressed over the issue of bi-catch. It was agreed that to the best of their abilities they would report bi-catch daily and an assessment could be made at that time. The upper limit of 150 bonefish collected was also discussed and it was suggested by the researchers that the 150 number may be too low and that additional collection might be required. That number was not reached by the end of the month.

#### **D. ADMINISTRATION**

1. **Personnel**

a. **FWS Personnel**

Biologist Depkin was on station the entire month of April.

b. **TNC Personnel**

TNC personnel on island all month were Matt and Elizabeth Lang, John Hill and Chryssi Mitchell.

c. **FWS Volunteers**

NTR

d. **TNC Volunteers**

TNC volunteers Steve and Cathy Fairchild and George Taylor were on island all month.

e. **Others**

NTR

f. **Arrivals and Departures**

On 09 April 2002 – SSV Robert S. Seamans: Arrives with a group “Semester at Sea” students. They departed on 11 April 2002.

On 23 April 2002 – G1 charter: Arrives with Bonefish researchers Alan Friedlander, Jim Beets and Beeing Yeeting, Hugh Milburn from NOAA and Charles Mathis here to inspect the fuel. They departed on 24 April 2002.

On 29 April 2002 – G1 charter: Arrives with TNC client group. They depart on 03 May 2002.

**HABITAT MANAGEMENT**

a. **Habitat Restoration or Modification**

Clearing and maintenance on the Short Fighter Strip was suspended due to Sooty Tern nesting activity. (see below)

The retrofitting of rat bait stations continued through the month.

b. Contaminates

NTR

c. Bird Aircraft Strike Management

Sooty Terns chicks continue to fledge. No bird aircraft strikes to report. On 03 April after looking at potential alternative nesting sites for Sooty Terns it was decided to open up (clear) an area near the west end of Menge Island. TNC personnel Matt Lang using a front-end loader was able to clear a test area. Some of the vegetation along the shoreline will be removed to allow air to move across the site and any vegetation that serves as good nesting substrata for other species (Tournefortia and Coccoloba) will be limbed up but left in place. It is hoped that with the use of decoys and play-backs combined with intense hazing at the runway site that we will be able to draw the Sooty Terns to this new site. If this works out then we will be able to expand the site in the future to accommodate more of the population.

WILDLIFE

a. Endangered and Threatened Species

NTR

b. Waterfowl

NTR

c. Marsh and Water Birds

NTR

d. Shorebirds, Gulls, Terns and Allied Species

1. Wedge-tailed Shearwater

NTR

2. Red-tailed Tropicbird

Present on the atoll.

3. White-tailed Tropicbird

Present on the atoll.

**4. Masked Booby**

The MIC for this species was conducted on 13-15 April 2002 (see section "C").

**5. Brown Booby**

The MIC for this species was conducted on 13-15 April 2002 (see section "C").

**6. Red-footed Booby**

On 18 April 2002 feeding flocks numbering in the thousands of Red-footed Boobies were seen just off of the north shore. It was during this same time period that several dead or dying adult Red-footed Boobies were found in different areas of the lagoon. By the end of the month close to 50 dead adults were reported. Four fresh dead Red-foots were sent to Honolulu for analysis. Initial examination revealed dehydration and no subcutaneous fat. Further analysis is expected.

**7. Great Frigatebird**

Present on the atoll.

**8. Lesser Frigatebird**

NTR

**9. Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

**10. Sooty Tern**

Sooty Tern chicks on both the Short Fighter Strip and Cooper Island were nearly fledged by the end of the month.

**11. Brown Noddy**

Present on the atoll.

**12. Black Noddy**

One fresh dead Black Noddy was collected and sent back to Honolulu for analysis. A banded (1483-35588) adult Black Noddy was found dead on 23 April 2002 on the Cooper Island runway. The bird was banded as a chick on 13 January 1998 at Tern Island, French Frigate Shoals.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

Present on the atoll<sup>2</sup>.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

Present on the atoll.

**17. Ruddy Turnstone**

Present on the atoll.

**e. Raptors**

NTR

**f. Other Migratory Birds**

On 16 April 2002 an adult Franklin's Gull was seen on the runway. It remained on island through the end of the month.

**f. Marine Mammals**

On both 20 and 27 April 2002 a large dolphin species was seen but was not identified.

**g. Fisheries Resources**

A total of 11 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
09 Apr 2002	Yellow Fin Tuna	17.54	104	
09 Apr 2002	Yellow Fin Tuna	23.68	114	
10 Apr 2002	Yellow Fin Tuna	24.63	119	
20 Apr 2002	Yellow Fin Tuna	16.54	101	
20 Apr 2002	Yellow Fin Tuna	15.72	99	
20 Apr 2002	Yellow Fin Tuna	12.54	86	
27 Apr 2002	Yellow Fin Tuna	30.09	123	
27 Apr 2002	Yellow Fin Tuna	22.00	112	
30 Apr 2002	Yellow Fin Tune	22.31	110	
30 Apr 2002	Yellow Fin Tuna	17.18	104	
30 Apr 2002	Yellow Fin Tuna	24.90	111	

1. kilograms
2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

#### **h. Scientific Collection**

Biologist Depkin collected four fresh dead Red-footed Boobies and one Black Noddy. They were sent to Wildlife Disease Specialist, Thierry Work, DMV, in Honolulu for analysis.

#### **i. Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. Steve and Kathy Fairchild and George Taylor were here through the month.

#### **j. Marking and Banding**

During the month of April, 3 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	3	9
Brown Booby	148	0
Masked Booby	3	0

#### **k. Disease Control and Prevention**

##### **1. Oiled Bird Sighting**

See collections in this section (h).

2. Other

NTR

**D. PUBLIC USE**

**a. Visiting Yachts**

The 134 foot steel brigantine Student Sailing Vessel Robert S. Seamans, Captain Virginia Land, visited the atoll from 09 April through 11 April 2002 with 32 POB. Both TNC and FWS personnel conducted trips through out the day of 10 April and managed to get everyone on board out to the snorkeling areas and/or out on natural history tours of the atoll which included a visit to Eastern Island. We were also treated to a lecture on the names and locations of various constellations and given a tour of the vessel. The Seamans departed on 11 April 2002 and as a favor started raising sails while still in the channel and had all sails up soon after clearing the channel. A great group of folks both crew and student alike and it is hoped that, in the future, we can work together to take advantage of future trips like this to benefit both the SEA Semester Program and Palmyra Atoll NWR.

**b. Client Groups**

One TNC client group visited the atoll this month arriving on 29 April 2002 and departing on 03 May 2002. Activities include fly fishing for bonefish, snorkeling, blue water fishing and natural history tours.

**c. Other**

NTR

**d. Law Enforcement**

NTR

**E. EQUIPMENT AND FACILITIES**

**a. General**

NTR

**b. Communications Systems**

NTR

Report prepared by: C. Depkin

## **Palmyra Atoll NWR Monthly Report**

### **May 2002**

#### **A. HIGHLIGHTS**

- ◆ On 03 May TNC clients and bonefish researchers depart.
- ◆ Pre-breeding groups of Sooty Terns return to the atoll at the beginning of the month.
- ◆ On 06 May conduct Great Frigatebird Mean Incubation Count survey (MIC).
- ◆ On 08 May M/V Pacific arrives with 2 POB. They depart on 13 May.
- ◆ On 10 through 12 May conducted the Red-tailed Tropicbird MIC.
- ◆ On 13 May the G1 charter arrives with a TNC client group. They depart on 17 May.
- ◆ On 13 May S/V Voladare arrives with 4 POB. They depart on 16 May.
- ◆ On 14 May S/V Nataraja arrives with 2 POB. They depart 25 May.
- ◆ On 24 May the Research Opportunities Group arrives to discuss the feasibility of establishing a research station here on Palmyra. They depart on 28 May.
- ◆ Conducted the Brown/Masked Booby MIC on 30 and 31 May.
- ◆ On 31 May radio contact was made with the long line fishing vessel Katie Mary. She was sitting only 3 miles out.

#### **B. WEATHER**

Rainfall total for May 2002 was 11.29 inches. Only 3 days were recorded with zero rainfall. Average maximum sun temperature was 33.2°C and the average minimum sun temperature was 24.7°C. Average maximum shade temperature was 31.2°C and the minimum shade temperature was 24.0°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly to easterly. Average cloud cover during the sample period was 69% (range 15-100%).

#### **C. RESEARCH AND MONITORING**

The turtle count was conducted on 31 May 2002 in the 3 locations reported previously. No distinction was made between species. Surveys were conducted at midday to reduce glare. The TNC off shore boat was anchored and observation were made from the roof.



Observation periods were 15 min. and the observer surveyed 360 degrees. Notes were made on wind speed, cloud cover and general viewing conditions. Latitude and Longitude were recorded for each anchor location. Locations of sightings were mapped and assigned a time and size class to help keep track of individuals. The first location was at the mid-point between the west end of the Short Fight Strip and the Cooper Island Dolphins. A total of 5 turtles were seen. The second location was on the west edge of the Center Lagoon where a total of 11 turtles were seen. The third location at the west end of the ship channel 12 turtles were observed for a total of 28 turtles seen.

The Great Frigatebird MIC was conducted on 06 May 2002. One new area was added this count.

LOCATION	# BIRDS ON NEST	# OF CHICKS	# COURTING MALES
Papala Island	20	2	12
Lost Island	14	0	9
Frigate Island	21	1	16
Middle Island	26	13	32
S Eastern Island	6	0	6
E of Middle Is.	38	6	18
Totals	125	22	93

Three shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone	Franklin's Gull
08 May 2002	0645	16	13	1	0	1
22 May 2002	0655	4	0	0	0	5
30 May 2002	0635	0	1	0	0	6

From 10 May through 12 May 2002 the Red-tailed Tropicbird MIC was conducted. A total of 41 new sites were found most of which were in the egg stage. This brings the total number of sites found to about 160 in the following locations; Ainsley, Dudley and Leslie Islands, the Long and Short Fighter Strips and 4 different sections of causeway (9 different locations). Due to the nesting habits of this species, they like to nest in dense fern, it is likely that other nesting locations exist.

The Brown/Masked Booby MIC was conducted from 30 May through 31 May 2002. A total of 188 active Brown Booby sites (26 eggs and 162 chicks) and 12 active Masked Booby sites (1 egg and 11 chicks) were surveyed. Nesting activity and in particular egg laying has dropped off quite a bit. There is no indication that Brown Boobies suffered the same type of mortality observed in the Red-footed Booby over the past 2 months.

On 03 May 2002 Researchers Dr. Alan M. Friedlander, Dr. Jim Beets and Dr. Beeing M. Yeeting (SUP# 12521-02017) depart. The group stayed under the limit of 150 bonefish collected and by the end of their collecting found various ways to minimize by-catch of non-target species. A report of their activities is due within 60 days of their departure.

## **D. ADMINISTRATION**

### **1. Personnel**

#### **a. FWS Personnel**

Biologist Depkin was on station the entire month of May. Rob Shallenberger arrived on 24 May 2002 and departed 28 May 2002.

#### **b. TNC Personnel**

TNC personnel on island all month were Matt and Elizabeth Lang, John Hill and Chryssi Mitchell.

#### **c. FWS Volunteers**

NTR

#### **d. TNC Volunteers**

TNC volunteers Susan and Doug Harshfield and Bill Ritz arrive on 24 May replacing Steve and Cathy Fairchild and George Taylor who departed 28 May 2002.

#### **e. Others**

NTR

#### **f. Arrivals and Departures**

On 29 April 2002 – G1 charter: Arrives with TNC client group. They depart on 03 May 2002.

On 08 May 2002 – S/V Pacific: Arrives with 2 POB. They depart 13 May 2002.

On 13 May 2002 – G1 charter: Arrives with TNC client group Jim Romig, Karen Banks, Jeff Banks, George Brown, Ernie Gabiati, Jeanne Gabiata, John Winther, and Argelio Maldonado as well as additional TNC personnel Chuck Cook, Nancy Mackinnon, James Ross, Todd Calitri and Jeff Nance.

On 13 May 2002 – S/V Voladare: Arrives with 4 POB bound for New Zealand. They departed 16 May 2002.

On 23 May 2002 – G1 charter: Arrives with members of the Research Opportunities Group; Chuck Cook - TNC, Nancy Mackinnon -TNC, Tundi Agardy - TNC consultant, Charles Conn -TNC consultant, Rob Shallenburger-

USFWS, Allen Allison - Bishop Museum, Terry Gosliner - California Academy of Sciences, Jeremy Jackson - Scripps Institute, Michael Lang - Smithsonian Institute, Steve Strand - University of California, Chuck Birkland University of Hawaii, Ken Kaneshiro - University of Hawaii. Also arriving were Susan and Doug Harshfield and Bill Ritz the new TNC rat crew members.

## HABITAT MANAGEMENT

### a. Habitat Restoration or Modification

Clearing and maintenance on the Short Fighter Strip was suspended due to Sooty Tern nesting activity. (see below)

The retrofitting of rat bait stations, transect maintenance and bait station checks continued through the month.

### b. Contaminates

NTR

### c. Bird Aircraft Strike Management

Sooty Terns chicks continue to fledge. Groups of pre-breeding Sooty Terns return to the atoll on the first of May and hazing resumes on the east end of the runway through the end of the month. No bird aircraft strikes to report. Work continues on the new Sooty Tern nesting area.

### d. Other

Several meetings took place between FWS Refuge Manager/Biologist Depkin and Honolulu based FWS Refuge Operation Specialist Rob Shallenberger. We discussed the issues of wildlife buffer zones, fishing regulations, access to fishing areas, boat use, and other subjects related to both Ecotourism and other public use activities. We also met with TNC personnel Chuck Cook and Nancy Mackinnon to discuss and refine some of the above issues. We are attempting to document some basic rules and guidelines for visiting tourist and fishing guides hired by TNC who's responsibility it is to guide tourist to the fish while at the same time minimizing wildlife disturbances.

## WILDLIFE

### a. Endangered and Threatened Species

NTR

**b. Waterfowl**

NTR

**c. Marsh and Water Birds**

NTR

**d. Shorebirds, Gulls, Terns and Allied Species**

**1. Wedge-tailed Shearwater**

On 10 May 2002 heard two calling over camp and in the morning found two dead wedge-tails dead in the surf at North Beach. Another dead one was found in the Center Lagoon on 11 May 2002. Cause of death is unknown. No other mortalities observed by the end of the month.

**2. Red-tailed Tropicbird**

The MIC for this species was conducted on 10, 11 and 12 May 2002, see section "C".

**3. White-tailed Tropicbird**

On 10 May 2002 an adult White-tailed Tropicbird was seen going into a Pisonia tree cavity on Eastern Island.

**4. Masked Booby**

The MIC for this species was conducted on 30 and 31 May 2002 (see section "C").

**5. Brown Booby**

The MIC for this species was conducted on 30 and 31 May 2002 (see section "C").

**6. Red-footed Booby**

The mortality event observed last month has tapered off but a few dead adults were found through the month.

**7. Great Frigatebird**

The Great Frigatebird MIC was conducted on 06 May 2002 see section "C".

**8. Lesser Frigatebird**

NTR

**9. Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

**10. Sooty Tern**

A few Sooty Tern chicks on both the Short Fighter Strip and Cooper Island are still present but nearly fledged. Pre-breeding groups of Sooty Terns returned to the atoll at the beginning of the month but remain poorly organized through the month. Most of the birds landing on the runway are coming into areas where a few Sooty Tern chick remain. Most of these chicks are injured or malformed and only a few are small chicks, a result of very late nesting. No serious nesting attempts were observed by the end of the month.

**11. Brown Noddy**

Present on the atoll.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

It seems that about 35 Plovers have stayed here for the summer as a group is regularly seen in the late afternoon on the runway and none posses breeding plumage.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

A group of about 25 curlews were seen flying from the Short Fighter Strip to Cooper Island and were seen later in the day on Cooper Island. They were not

seen subsequently and the number of curlews seen on the atoll the rest of the month were very low.

### 17. Ruddy Turnstone

A group of 5 to 7 seen with the group of plovers, on the runway ion the late afternoon.

#### e. Raptors

NTR

#### f. Other Migratory Birds

As many as 6 Franklin's Gulls were seen through out the month. Some posses more pink in the plumage than others and in others the feet and bill are redder. All are in breeding plumage.

#### f. Marine Mammals

Several sighting were noted this month and are listed below.

DATE	SPECIES	COUNT
14 May 2002	Spinner Dolphins	50+
14 May 2002	Small unknown dolphins	20+
15 May 2002	Spinner Dolphins	10+
15 May 2002	Melon-headed Whales	100+
15 May 2002	Bottlenose Dolphins	20+
17 May 2002	Melon-headed Whales	100+

#### g. Fisheries Resources

A total of 12 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
10 May 2002	Yellow Fin Tuna	22.09	110	
10 May 2002	Yellow Fin Tuna	29.40	124	
13 May 2002	Yellow Fin Tuna	21.27	Na	
15 May 2002	Yellow Fin Tuna	14.54	Na	
15 May 2002	Yellow Fin Tuna	6.54	Na	
17 May 2002	Yellow Fin Tuna	21.36	109	
22 May 2002	Yellow Fin Tuna	21.59	112	
22 May 2002	Yellow Fin Tuna	18.40	102	
24 May 2002	Yellow Fin Tuna	18.90	102	

24 May 2002	Yellow Fin Tuna	18.09	98	
24 May 2002	Yellow Fin Tuna	17.54	98	
25 May 2002	Yellow Fin Tuna	25.68	112	

1. kilograms
2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

#### **h. Scientific Collection**

About 135 bonefish were collected during the bonefish research effort. A number of other fish were taken as incidental catch. That number is not available at this time.

One Red-footed Booby, found dead, was collected and will be sent back to Honolulu.

#### **i. Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month.

#### **j. Marking and Banding**

During the month of May, 3 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	19	42
Brown Booby	47	0
Masked Booby	1	0

#### **k. Disease Control and Prevention**

##### **1. Oiled Bird Sighting**

NTR

##### **2. Other**

NTR

### **D. PUBLIC USE**

#### **a. Visiting Yachts**

Palmyra offers an unusual range of public use opportunities. During the month of May 3 different vessels visited the atoll.

Vessel name	POB	Arrival Date	Depart Date	Registry	Comments
M/V Pacific	2	08 May 2002	13 May 2002	USA	To CONUS
S/V Voladare	4	13 May 2002	16 May 2002	?	To New Zealand
S/V Nataraja	2	14 May 2002	25 May 2002	USA	To South

#### **b. Client Groups**

Two TNC client groups visited the atoll this month. The first arriving on 29 April 2002 and departing on 03 May 2002 and the second arriving on 13v May departing on 17 May 2002. Activities include fly fishing for bonefish, snorkeling, blue water fishing and natural history tours. The Research Opportunities Group also visited the atoll from 24 through 28 May 2002.

#### **c. Other**

NTR

#### **d. Law Enforcement**

On 30 May 2002 at about 1615 hours local, U. S. Fish and Wildlife Service (FWS) personnel (Chris Depkin) established VHF radio contact with the F/V Katie Mary, Captain Jerry Ray. Greetings were exchanged and it was established that the Katie Mary was waiting outside the 3 mile limit for the long line season to begin.

FWS personnel then advised Captain Ray that Palmyra Atoll was a National Wildlife Refuge and explained of the existence of the 12 nautical mile no take zone in place both here at Palmyra and at Kingman Reef as well. FWS personnel stated that from the atoll to 12 nautical miles out to sea was closed to all commercial fishing. Captain Ray responded that due to the disputed status of the 12 mile zone that it (the 12 mile zone) was not yet closed to commercial fishing.

FWS personnel assured the captain that is was and that the 12 mile zone was patrolled by the US Coast Guard. Captain Ray then advised FWS personnel that he would contact his office for advice. Captain Ray would contact Palmyra FWS again as soon as he heard from his office.

FWS personnel Depkin then contacted the main FWS office in Honolulu and advised his supervisors of the situation.

At around 1650 hours the F/V Katie Mary hailed FWS. Captain Ray received advice from his office that they (the main office) would check into the status



of the 12 mile limit but in the mean time they (F/V Katie Mary) were to move outside the 12 mile limit.

Captain Ray informed FWS personnel of his intentions to move outside the 12 mile limit and was cooperative on every level.

Radio contact was then broken.

#### **E. EQUIPMENT AND FACILITIES**

##### **a. General**

A second mooring buoy was installed in the area of Penguin Spite. Both moorings were located in areas where little live coral exists. With two moorings in place boats no longer need to anchor in that area to snorkel dive but can tie up to the buoys instead.

##### **b. Communications Systems**

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report  
June 2002**

**A. HIGHLIGHTS**

- ◆ On 10 June conducted the Red-footed Booby Mean Incubation Count Survey (MIC).
- ◆ On 10 June S/V Aeolus arrives with 5 POB.
- ◆ On 13 June S/V Bird of Paradise arrives with 2 POB.
- ◆ On 20 June USCGC Jarvis arrives off shore to conduct a flight crew change.
- ◆ On 20 June USCG C-130 1711 arrives with replacement personnel for the Cutter Jarvis.
- ◆ On 21 and 25 June fresh turtle nest pits were found on North Beach, Cooper Island.
- ◆ On 22 and 23 June the Red-tailed Tropicbird MIC was conducted.
- ◆ We still have rats that are not using the bucket bait stations.
- ◆ There are now 9 Franklin's Gull on Cooper Island and one was seen carrying nesting material.

**B. WEATHER**

Rainfall total for June 2002 was 12.70 inches. Only 2 days were recorded with zero rainfall. Average maximum sun temperature was 33.1°C and the average minimum sun temperature was 25°C. Average maximum shade temperature was 31.3°C and the minimum shade temperature was 24.3°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly to easterly. Average cloud cover during the sample period was 57% (range 0-100%).

**C. RESEARCH AND MONITORING**

Only two shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone	Franklin's Gull
04 June 2002	0650	3	0	0	0	0
25 June 2002	0640	26	2	0	3	5

A group of over summering plovers, about 30, and Ruddy Turnstones, about 5, continue to be seen in the afternoon. It is believed that the high count on 25 June 2002 was comprised of members of that group as none of the plovers counted displayed any alternate plumage.

On 10 June 2002 the Red-footed Bobby MIC was conducted. The results are listed below along with the results of previous surveys.

DATES	# OF EGGS	# OF CHICKS	# TOTAL SITES
06 Sep 2001	247	79	326
23 Oct 2001	30	146	176
07 Dec 2001	8	111	119
22 Jan 2002	271	60	331
07 Mar 2002	92	162	254
24 Apr 2002	235	217	452
10 June 2002	46	236	282

From 22 June through 23 June 2002 the Red-tailed Tropicbird MIC was conducted. A total of 30 new sites were found most of which were in the egg stage. This bring the total number of sites found to about 190 in the following locations; Ainsley, Dudley and Leslie Islands, the Long and Short Fighter Strips and 4 different sections of causeway (9 different locations). A total of 100 chicks have been banded since last August. We also discovered our first recaptures this month. Both were successful breeders (fledged a chick) from last year. One was found on an egg last August and the other on a small chick in September. Seems a little early for them to be re-nesting. Due to the nesting habits of this species, they seem to prefer dense fern, it is likely that other nesting locations exist.

#### **D. ADMINISTRATION**

##### **1. Personnel**

###### **a. FWS Personnel**

Biologist Depkin was on station the entire month of June.

###### **b. TNC Personnel**

TNC personnel on island all month were Matt and Elizabeth Lang, John Hill and Chryssi Mitchell.

###### **c. FWS Volunteers**

NTR

###### **d. TNC Volunteers**

TNC volunteers Susan and Doug Harshfield and Bill Ritz were on island all month.

e. **Others**

NTR

f. **Arrivals and Departures**

On 10 June 2002 – S/V Aeolus: Arrives with 5 POB. They departed on 16 June 2002.

On 13 June 2002 – S/V Bird Of Paradise: Arrives with 2 POB. They depart 17 June 2002.

On 20 June 2002 USCGC Jarvis: Arrives off shore to conduct a pilot exchange. They depart within hours.

On 20 June 2002 USCC C-130 1711: Arrives to meet with Cutter Jarvis and drop off new flight crew and take off the old flight crew. They depart within hours.

## **HABITAT MANAGEMENT**

a. **Habitat Restoration or Modification**

Clearing and maintenance on the Short Fighter Strip has continued as all of the Sooty Tern chicks have fledged.

The retrofitting of rat bait stations, transect maintenance and bait station checks continued through the month.

During a night survey conducted by the Refuge Biologist on Sand Island on 25 June 2002 a number of rats were seen along the north shore. All size classes from small non-breeders to full adults size rats were seen. Most were seen in close proximity of established bait stations. Sand Island had been considered rat free previous to this date. This is not to say that we considered all rats gone from Sand Island and others like it but that we were in the last stages of eradication and that breeding populations had been mostly taken care of.

Due to concerns that other islands also classed as rat free maintained breeding populations the refuge biologist conducted nights surveys on the other islands also classed as rat free over the next two nights. All transect were walked using a head lamp and Q-beam<sup>®</sup>. Those results are listed below.

ISLAND	RATS SEEN Y/N	COMMENTS
Dudley Island	N	
Leslie Island	N	
Short Fighter Strip	N	
Long Fighter Strip	N	
Fern Island	N	
Lost Island	N	
Bunker Island	N	
Whippoorwill Island	N	
Quail Island	Y	One seen next to station L1
Eastern Island <sup>1</sup>	Y	Over 15 seen from trans 1-20

Not seeing rats does not mean that they are not there and the one rat that was seen on Quail Island is not that alarming considering that the maintenance program should be able to control and eventually eliminate a few non-breeders.

b. Contaminates

The S/V Aeolus reported seeing small amounts of an oil substance floating to the surface in the area of their anchorage at about N05° 53.190' and W162° 05.315'. None was seen by refuge personnel, none was collected.

c. Bird Aircraft Strike Management

Groups of pre-breeding Sooty Terns remained through out the month and hazing resumes on the east end of the runway through the end of the month. No birds seen landing on Cooper Island but a small group was seen on the night of 26 June 2002 on the Short Fighter Strip. No bird aircraft strikes to report. Work continues on the new Sooty Tern nesting area.

d. Other

## WILDLIFE

a. Endangered and Threatened Species

On 21 June 2002 and again on 25 June 2002 a total of 3 turtle pits were found. Pits were located at the east end of North Beach on Cooper Island. All sites were marked and will be checked around 60 days from the estimated time of laying for both signs of hatching and potential retrieval of partially developed turtles for use in genetics work.

Also visited the beach at the end of Strawn Island and the beach on the east side of Papala Island and found no other sign of turtle nesting.

**b. Waterfowl**

NTR

**c. Marsh and Water Birds**

NTR

**d. Shorebirds, Gulls, Terns and Allied Species**

**1. Wedge-tailed Shearwater**

NTR

**2. Red-tailed Tropicbird**

The MIC for this species was conducted on 22 and 23 June 2002, see section "C".

**3. White-tailed Tropicbird**

Present on the atoll.

**4. Masked Booby**

Present on the atoll.

**5. Brown Booby**

Present on the atoll.

**6. Red-footed Booby**

The mortality event observed last month has tapered off but a few dead adults were found through the month. The MIC was conducted on 10 June 2002 (see section C.)

**7. Great Frigatebird**

Present on the atoll.

**8. Lesser Frigatebird**

Several seen just west of the atoll near the main ship channel.

#### **9. Laughing Gull**

The first winter bird was still on the atoll at the end of the month.

#### **10. Sooty Tern**

A few Sooty Tern chicks on Cooper Island are still present but nearly fledged. Pre-breeding groups of Sooty Terns returned to the atoll at the beginning of May but remain poorly organized through the month of June. Very few birds were seen landing on the runway this month. Most of the birds landing on the runway were coming into areas where the few Sooty Tern chick remain. Most of these chicks are injured or malformed and only a few are small chicks, a result of very late nesting. No serious nesting attempts were observed by the end of the month.

#### **11. Brown Noddy**

Present on the atoll. It seems that this species is the only one that uses coconut palms for nesting. Caution will need to be exercised when cutting palms.

#### **12. Black Noddy**

Present on the atoll.

#### **13. White Tern**

Present on the atoll.

#### **14. Pacific Golden-Plover**

It seems that about 35 Plovers have stayed here for the summer as a group is regularly seen in the late afternoon on the runway and none posses breeding plumage.

#### **15. Wandering Tattler**

Present on the atoll.

#### **16. Bristle-thighed Curlew**

A small number are seen including Skippy the rehab curlew.

#### **17. Ruddy Turnstone**

A group of 5 to 7 seen with the group of plovers, on the runway ion the late afternoon.

e. **Raptors**

NTR

f. **Other Migratory Birds**

A total of 9 Franklin's Gulls were seen from 01 June to 11 June 2002. The more constant number seen through out the month was 5. They are seen on the east end of the runway and often follow the heavy machinery conducting maintenance work on the active and aprons of the east runway.

f. **Marine Mammals**

Two sighting were noted this month and are listed below.

DATE	SPECIES	COUNT
08 June 2002	Unknown whales 20+feet	10-12
08 June 2002	Bottlenose Dolphins	4

g. **Fisheries Resources**

A total of 2 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
08 June 2002	Yellow Fin Tuna	17.04	102	
08 June 2002	Yellow Fin Tuna	18.45	107	

1. kilograms

2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

h. **Scientific Collection**

One Red-footed Booby was found dead and will be sent back to Honolulu.

i. **Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. See habitat management.



j. **Marking and Banding**

During the month of June, 2 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	30	21
Brown Booby	17	0

k. **Disease Control and Prevention**1. **Oiled Bird Sighting**

NTR

2. **Other**

NTR

**D. PUBLIC USE**a. **Visiting Yachts**

Palmyra offers an unusual range of public use opportunities. During the month of June 2 different vessels visited the atoll.

Vessel name	POB	Arrival Date	Depart Date	Registry
S/V Aeolus	5	10 June 2002	16 June 2002	USA
S/V Bird Of Paradise	2	13 June 2002	17 June 2002	USA

b. **Client Groups**

NTR

c. **Other**

NTR

d. **Law Enforcement**

NTR

**E. EQUIPMENT AND FACILITIES**

a. General

NTR

b. Communications Systems

NTR

Report prepared by: C. Depkin

## Palmyra Atoll NWR Monthly Report July 2002

### A. HIGHLIGHTS

- ◆ On 03 July conducted the Great Frigatebird survey.
- ◆ On 05 July finished entering vegetation transect data.
- ◆ On 05 July collected mosquito larva to be sent to Honolulu for identification.
- ◆ On 07 July G1 charter arrives with U of H college group. Plane departs same day.
- ◆ On 12 July G1 charter arrives with cargo and departs the next day with the college group.
- ◆ On 16 July conducted the Brown/Masked Booby survey.
- ◆ Another Red-footed Booby mortality event is under way and as many as 200 adults may have died this time.
- ◆ On 26 July dropped a dive boat mooring on the north west reef area.
- ◆ On 26 July conducted the Red-footed Booby survey.

### B. WEATHER

Rainfall total for July 2002 was 16.98 inches. Only 4 days were recorded with zero rainfall. Average maximum sun temperature was 33.5°C and the average minimum sun temperature was 24.6°C. Average maximum shade temperature was 30.1°C and the minimum shade temperature was 24.4°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly to easterly. Average cloud cover during the sample period was 69% (range 20-100%).

### C. RESEARCH AND MONITORING

Only two shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden-Plover	Bristle-Thighed Curlew	Wandering Tattler	Ruddy Turnstone	Franklin's Gull
17 July 2002	0700	10	0	0	3	1
31 July 2002	0715	13	1	2	0	0

A group of over summering plovers, about 30, and Ruddy Turnstones, about 5, continue to be seen in the afternoon. It is believed that the high count on 25 June 2002 was comprised of members of that group as none of the plovers counted displayed any alternate plumage.

The turtle count was conducted on 02 July 2002 in the 3 locations reported previously. No distinction was made between species. Surveys were conducted at midday to reduce glare. The TNC off shore boat was anchored and observation were made from the roof. Observation periods were 15 min. and the observer surveyed 360 degrees. Notes were made on wind speed, cloud cover and general viewing conditions. Latitude and Longitude were recorded for each anchor location. Locations of sightings were mapped and assigned a time and size class to help keep track of individuals. The first location was at the mid-point between the west end of the Short Fight Strip and the Cooper Island Dolphins. A total of 4 turtles were seen. The second location was on the west edge of the Center Lagoon were a total of 11 turtles were seen. The third location at the west end of the ship channel 9 turtles were observed for a total of 24 turtles seen.

On 03 July 2002 the Great Frigatebird mean incubation count (MIC) was conducted. The results are listed below.

LOCATION	# BIRDS ON NEST	# OF CHICKS	# COURTING MALES
Papala Island	7	5	3
Lost Island	8	8	2
Frigate Island	5	11	0
Middle Island	10	4	0
S Eastern Island	5	0	0
E of Middle Is.	12	6	0
Totals	44	34	5

On 16 July 2002 the Brown/Masked Booby MIC was conducted. A total of 82 active Brown sites were found (15 on eggs and the rest medium to large chicks). Only 8 Masked sites were found and none of those were on eggs.

On 26 July 2002 the Red-footed Bobby MIC was conducted. The results are listed below along with the results of previous surveys. Although the sample area is small a total of 9 recently dead adults and 5 recently dead chicks were found.

DATES	# OF EGGS	# OF CHICKS	# TOTAL SITES
06 Sep 2001	247	79	326
23 Oct 2001	30	146	176
07 Dec 2001	8	111	119
22 Jan 2002	271	60	331
07 Mar 2002	92	162	254
24 Apr 2002	235	217	452
10 June 2002	46	236	282
26 July 2002	0	151	151

## **D. ADMINISTRATION**

### **1. Personnel**

#### **a. FWS Personnel**

Biologist Depkin was on station the entire month of July.

#### **b. TNC Personnel**

On 20 July 2002, Tutu, the real owner of Palmyra died along the shoreline. A service was held later in the day and words were spoken. He will be missed by all.

TNC personnel on island all month were Matt and Elizabeth Lang. John Hill and Chryssi Mitchell departed on 13 July 2002.

#### **c. FWS Volunteers**

NTR

#### **d. TNC Volunteers**

TNC volunteers Susan and Doug Harshfield and Bill Ritz were on island all month.

#### **e. Others**

NTR

#### **f. Arrivals and Departures**

On 07 July 2002 – G1 Charter: Arrives with the U of H college group lead by Dr. Carla McDermid. Others arriving include instructor Randall Kosaki, dive master Keith Strieck, students Kahea David, Tanya DeCambra, Candice Guavis, Lia Hannon, Jedda Hame'enui, Noa Lincoln, Tami-Lee Oili, Elaine Pablo, Brad Phillip, Brooke Stuercke, Rachel Trimble and Ku'ulei Vickery as well as pilot Larry Nue and co-pilot Max Reinig. The plane departed on the same day with pilot and co-pilot.

On 12 July 2002 – G1 Charter: Arrives with cargo.

On 13 July 2002 – G1 Charter: Departs with the college group as well as John Hill and Chryssi Mitchell.

## **HABITAT MANAGEMENT**

### **a. Habitat Restoration or Modification**

Several days this month were dedicated to rat lane maintenance. On the Cooper Island Complex this mostly consisted of using a chainsaw to cut back encroaching vegetation like Scaevola. On 30 July 2002 the rat crew, refuge biologist and the TNC manager all went to the Long Fighter Strip and spent all morning opening the rat lanes there using both chainsaws and weed eaters. Due to the large amounts of rain fall that we get on the atoll trail maintenance is going to be an on going concern.

### **b. Contaminates**

We have been trying to reduce the breeding areas for mosquitoes by removing or modifying those structures that collect water. To this end we started restaging the old 55 gallon barrels located between the fish camp and the yacht club on Cooper Island. These barrels provide great locations for mosquito breeding. After moving 10 of the barrels we were able to read the labels on some of the less corroded ones. They are property of the US Navy. We stopped work and notified the FWS office. Some of the barrels still smell of fuel though most if not all are empty and highly degraded.

### **c. Bird Aircraft Strike Management**

Groups of pre-breeding Sooty Terns remained through out the month and hazing resumes on the east end of the runway. The number of Sooty Terns present has varied greatly over the month from several thousand to none at all. Still no breeding but the numbers still warrant late afternoon and evening hazing.

### **d. Other**

## **WILDLIFE**

### **a. Endangered and Threatened Species**

On 21 June 2002 and again on 25 June 2002 a total of 3 turtle pits were found. Pits were located at the east end of North Beach on Cooper Island. Several more sites were found during the month of July all on North Beach. All new sites were marked and will be checked later.

### **b. Waterfowl**

NTR

c. Marsh and Water Birds

NTR

d. Shorebirds, Gulls, Terns and Allied Species

1. **Wedge-tailed Shearwater**

NTR

2. **Red-tailed Tropicbird**

Present on the atoll

3. **White-tailed Tropicbird**

Found the forth White-tailed nesting cavity. This one is located on Eastern Island low in a Pisonia cavity. There were 3 birds in this location for several minuets and 2 of those birds were locked in battle. The third bird appeared to be an on looker probably one of the mates to the ones that were fighting.

4. **Masked Booby**

Conducted the MIC for this species on 16 July 2002, see section "C".

5. **Brown Booby**

Conducted the MIC for this species on 16 July 2002, see section "C". Unlike the Red-foots there has been no mortality seen in the Brown Booby breeding population either adults or chicks.

6. **Red-footed Booby**

Conducted the MIC for this species on 26 July 2002 and it is the first survey that has resulted in a no egg count. There was both chick and adult mortality observed during this survey. Between 16 and 18 July close to 100 birds were found either fresh dead or dying and it is likely that the number of dead adults is twice that.

7. **Great Frigatebird**

Conducted the MIC for this species 03 July 2002, see section "C".

8. **Lesser Frigatebird**

Several seen just west of the atoll near the main ship channel.

**9. Laughing Gull**

The first winter bird was not seen during shorebird counts but was seen on Smitty's around mid-month.

**10. Sooty Tern**

Still no breeding activity seen for this species except for the near daily aerial activities over the Central Lagoon, the Short Fighter Strip and Cooper Island. Even these activities have been inconsistent in nature where numbers have ranged from none at all to several thousand birds.

**11. Brown Noddy**

Present on the atoll. It seems that this species is the only one that uses coconut palms for nesting. Caution will need to be exercised when cutting palms.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

It seems that about 35 Plovers have stayed here for the summer as a group is regularly seen in the late afternoon on the runway and none possess breeding plumage.

**15. Wandering Tattler**

Present on the atoll.

**16. Bristle-thighed Curlew**

Present on the atoll.

**17. Ruddy Turnstone**

Present on the atoll.



e. Raptors

NTR

f. Other Migratory Birds

The Franklin's Gulls were seen until the middle of the month and then the last one vanished.

f. Marine Mammals

Several sighting were noted this month during blue water excursions and are listed below.

DATE	SPECIES	COUNT
10 July 2002	Melon-Headed Whale	150
11 July 2002	Melon-Headed Whale	100+
11 July 2002	Bottlenose Dolphin	20-50
12 July 2002	Spinner Dolphin	20-40
23 July 2002	Bottlenose Dolphin	10-20
26 July 2002	Spinner Dolphin	20+

g. Fisheries Resources

A total of 5 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
08 July 2002	Yellow Fin tuna	20.95	114	
08 July 2002	Yellow Fin tuna	13.45	93	
08 July 2002	Yellow Fin tuna	15.13	93	
12 July 2002	Yellow Fin tuna	17.45	102	
22 July 2002	Yellow Fin tuna	23.13	117	

1. kilograms

2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

h. Scientific Collection

Four Red-footed Booby were found dead and will be sent back to Honolulu.

Several mosquito larva samples were collected from Sand and Cooper Islands. They were sent back to Honolulu to be identified.

Two additional blood samples were collected from Masked Booby chicks this month and will be sent off next month to David Anderson.

i. **Animal Control**

The Rat Eradication Program, funded by TNC and headed by USDA personnel James Murphy continued through the month. See habitat management.

j. **Marking and Banding**

During the month of July, 2 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Masked Booby	3	0
Brown Booby	13	0

k. **Disease Control and Prevention**

1. **Oiled Bird Sighting**

NTR

2. **Other**

NTR

**D. PUBLIC USE**

a. **Visiting Yachts**

NTR

b. **Client Groups**

NTR

c. **Other**

The Marine Science Department of the University of Hawaii at Hilo with help from NOAA's Educational Partnership Program Grant for Minority Serving Institutions, sponsored a one week field trip for 12 college students. The trip was organized and lead by Dr. Carla McDermid with assistance from instructor Dr. Randall Kosaki. Students were exposed to a wide verity of field

conditions both aquatic and terrestrial and were responsible for making a presentation at the end of their trip on a related subject of their choice.

Activities included snorkeling, bird banding, hiking, photography, kayaking and crab marking and recapturing.

d. Law Enforcement

On 26 July 2002 made contact with fishing vessel "Galahad". They were transiting Refuge waters but were informed of the 12 mile Refuge boundary and that no commercial fishing was allowed within the Refuge.

E. EQUIPMENT AND FACILITIES

a. General

The FWS chainsaw was sent off island for service. A new saw was purchased but did not make it down on the cargo flight.

b. Communications Systems

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report**  
**August 2002**

**A. HIGHLIGHTS**

- ◆ Set several markers and cuts trails to access Smitty's and Down East.
- ◆ Reset both north and south main ship channel marker buoys just west of Sand Island.
- ◆ On 05 Aug conducted the Red-tailed Tropicbird survey.
- ◆ On 15 Aug the S/V Ola Mai Kai arrives with 3 POB departing on 19 Aug.
- ◆ On 18 Aug a TNC charter arrives with clients whose main purpose is to tag bonefish. They depart on 22 Aug.
- ◆ On 24 Aug the S/V Mari-Chi III arrives with 9 POB departing on 26 Aug..
- ◆ On 25 Aug the Refuge Biologist spotted a series of white floats just off the north shore. It turned out to be several thousand feet of a lost long line set. Most was retrieved and brought to shore.
- ◆ On 27 Aug the Great Frigatebird survey was conducted.
- ◆ On 28 Aug the Brown/Masked Booby survey was conducted.
- ◆ Sooty Tern numbers continue to rise and fall in the late afternoon and evening but so far still no breeding/egg laying has taken place.

**B. WEATHER**

Rainfall total for August 2002 was 19 inches. Only 1 day was recorded with zero rainfall. Average maximum sun temperature was 33.5°C and the average minimum sun temperature was 25.2°C. Average maximum shade temperature was 30.3°C and the minimum shade temperature was 24.4°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly to easterly but on several occasions was southerly and westerly. Average cloud cover during the sample period (between 0800 and 0700) was 76% (range 15-100%). The end of August marks the end of the first year of FWS collecting these basic weather parameters. Total rain fall over the past 12 month period was 168.82 inches with only 51 days with no recorded rainfall.

**RAIN FALL TOTALS FOR THE PAST 12 MONTHS, SEPT 01 – AUG 02**

SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
9.08	12.14	11.21	17.06	17.3	11.62	13.03	17.38	11.32	12.7	16.98	19

### C. RESEARCH AND MONITORING

Four shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden- Plover	Bristle- Thighed Curlew	Wandering Tattler	Ruddy Turnstone
08 Aug 2002	0710	47	6	3	39
15 Aug 2002	0700	26	20	3	0
23 Aug 2002	0645	38	9	1	7
29 Aug 2002	0655	49	20	2	2

During the middle of the month an increase in the number of shorebirds was observed. As many as 100 Pacific Golden-Plovers were seen on the runway as well as 40 or more Ruddy Turnstones. On 14 August 40 or more Bristle-thighed Curlews were seen on the small spit of coral just south of Barren Island. No increase of Wandering Tattlers was noticed and the surge of incoming shorebirds seemed to slow by the end of the month.

The Red-tailed Tropicbird mean incubation count (MIC) was conducted on 05 August 2002. A total of 12 new sites were found and a total of 36 known active sites. At least 4 chick were found dead this month, 3 of which were nearly full sized. This is consistent with failure trends seen in Red-footed Boobies as well. That population (red-foots) is at it's lowest reproductive level observed over the past year.

The turtle count was conducted on 23 August 2002 in the 3 locations reported previously. No distinction was made between species. Surveys were conducted at midday to reduce glare. The TNC off shore boat was anchored and observation were made from the roof. Observation periods were 15 min. and the observer surveyed 360 degrees. Notes were made on wind speed, cloud cover and general viewing conditions. Latitude and Longitude were recorded for each anchor location. Locations of sightings were mapped and assigned a time and size class to help keep track of individuals. The first location was at the mid-point between the west end of the Short Fight Strip and the Cooper Island Dolphins. A total of 2 turtles were seen. The second location was on the west edge of the Center Lagoon were a total of 7 turtles were seen. The third location at the west end of the ship channel 9 turtles were observed for a total of 18 turtles seen.

Small (platter size) turtles continue to be seen in the shallows just east of East Pass. On 02 August, 9 of these turtles were seen in this location. Several days later as many as 12 were seen in the same area. It is common to see larger turtles on the flats between East Pass and the Coral Gardens.

On 27 August 2002 the Great Frigatebird mean incubation count (MIC) was conducted. The results are listed below.

LOCATION	# BIRDS ON NEST	# OF CHICKS	# COURTING MALES
Papala Island	2	4	3
Lost Island	1	5	2
Frigate Island	1	7	1
Middle Island	0	3	0
S Eastern Island	0	0	0
E of Middle Is.	3	13	0
Totals	7	32	6

On 28 August 2002 the Brown/Masked Booby MIC was conducted. A total of 106 active Brown sites were found, 44 on eggs and the rest medium to large chicks. Of the 18 historic sites surveyed for Brown Boobies only the main East/West cause way and the south section of the North/South Causeway had adults on eggs, 43 and 1 respectively. Only 6 Masked sites were found 2 of which were on eggs. No adult or chick mortality has been observed in these populations.

#### **D. ADMINISTRATION**

##### **1. Personnel**

###### **a. FWS Personnel**

Biologist Depkin was on station the entire month of August.

###### **b. TNC Personnel**

TNC personnel on island all month were Matt and Elizabeth Lang. John Hill and Chryssi Mitchell arrived with the client group on 18 August and remained on island the rest of the month. Chuck Cook and Nancy Mackinnon arrived with the client group on 18 August and departed on 22 August 2002.

###### **c. FWS Volunteers**

**NTR**

###### **d. TNC Volunteers**

TNC volunteers Susan and Doug Harshfield and Bill Ritz departed on 22 August 2002 and were replaced by returnees Clare Patterson and Chuck and Sally Heath who arrived on 18 August 2002. They also remained on island through the end of the month.

e. **Others**

NTR

f. **Arrivals and Departures**

On 15 August 2002 – S/V Ola Mai Kai: Arrives with 3 POB. They departed on 19 August 2002.

On 18 August 2002 – G1 Charter: Arrives with TNC client group with the following personnel; Chuck Cook, Marty Fujita, Nancy Mackinnon, David Perkins, Dan Martin, Mike Sutton, Kelvin Taketa, Richard Gushman, dive master Jeffery Nance, boat captain Mike Cullen, returning TNC personnel John Hill and Chryssi Mitchell, TNC volunteers Clare Patterson and Chuck and Sally Heath, as well as pilot Larry Nue and co-pilot Max Reinig.

On 22 August 2002 – G1 Charter: Departs with TNC client group with the following personnel; Chuck Cook, Marty Fujita, Nancy Mackinnon, David Perkins, Dan Martin, Mike Sutton, Kelvin Taketa Richard Gushman, dive master Jeffery Nance, boat captain Mike Cullen, TNC volunteers Susan and Doug Harshfield and Bill Ritz, as well as pilot Larry Nue and co-pilot Max Reinig.

On 24 August 2002 – S/V Mari Cha III: Arrives with 9 POB. They depart on 26 August 2002.

## **HABITAT MANAGEMENT**

a. **Habitat Restoration or Modification**

Several days this months were dedicated to rat lane maintenance. On the Cooper Island Complex this mostly consisted of using a chainsaw to cut back encroaching vegetation like Scaevola. On 01 August 2002 the refuge biologist and the TNC manager cleared trails on Dudley Island. On 06 August went to the Short Fighter Strip and spent all morning opening the rat lanes and clearing the Sooty Tern nesting area of high growing plant material. Rat lane maintenance continues on the Cooper Island Complex.

On 25 August 2002 the Refuge Biologist spotted several small white floats just off of the north shore of Cooper Island. On 26 August 2002 and with the assistance of John Hill and Chryssi Mitchell we were able to paddle kayaks out beyond the surf and identified a long line set about 2000 feet in length. We collect hundreds of feet of monofilament and several hook sets and hope to get back out soon to collect the rest of the set. We saved the set and one of the floats in the hopes that we will be able to identify the origin of the set. .

b. Contaminates

NTR

c. Bird Aircraft Strike Management

Groups of pre-breeding Sooty Terns remained through out the month and hazing resumes on the east end of the runway. The number of Sooty Terns present has varied greatly over the month from several thousand to none at all. Still no breeding but the numbers still warrant late afternoon and evening hazing. We also received a CD of calling Sooty Terns and on 28 August 2002 set out the new wildlife caller in hopes of enticing the terns to the newly cleared area on Menge Island. By the end of the month there was no perceived change in the distribution of Sooty Terns.

d. Other

WILDLIFE

a. Endangered and Threatened Species

On 21 June 2002 and again on 25 June 2002 a total of 3 turtle crawls were found. Two more crawls were found on 16 July and by the end of the month of August one more crawl was found. Crawls were located on North Beach on Cooper Island. On 29 August 2002 a very fresh turtle hatching was found dead near one of the first located crawls. It's head had been eaten off but the rest of the body was very fresh. It was collected and will be sent back to Honolulu.

b. Waterfowl

NTR

c. Marsh and Water Birds

NTR

d. Shorebirds, Gulls, Terns and Allied Species

1. Wedge-tailed Shearwater

NTR

2. Red-tailed Tropicbird



The MIC was conducted for this species this month with some chick mortality observed. Adults continue to lay eggs at the same time large chicks are being abandoned by their parents. Birds continue to be seen courting.

### **3. White-tailed Tropicbird**

The new nest site found last month now seems to be occupied by a bird sitting on an egg.

### **4. Masked Booby**

Conducted the MIC for this species on 28 August 2002, see section "C".

### **5. Brown Booby**

Conducted the MIC for this species on 28 August 2002, see section "C". Unlike the Red-foots there has been no mortality seen in the Brown Booby breeding population either adults or chicks.

### **6. Red-footed Booby**

The adult mortality has slowed to a near stop with an occasional dead adult seen. Although no survey was conducted this month very little nesting activity was observed.

### **7. Great Frigatebird**

Conducted the MIC for this species 27 August 2002, see section "C".

### **8. Lesser Frigatebird**

Several seen just west of the atoll near the main ship channel.

### **9. Laughing Gull**

Our first winter bird was not seen all month and may have departed.

### **10. Sooty Tern**

Still no breeding activity seen for this species except for the near daily aerial activities over the Central Lagoon, the Short Fighter Strip and Cooper Island. Even these activities have been inconsistent in nature where number have ranged from none at all to several thousand birds. No birds were seen on the ground this month.

**11. Brown Noddy**

Present on the atoll. It seems that this species is the only one that uses coconut palms for nesting. Caution will need to be exercised when cutting palms.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

Present on the atoll.

**14. Pacific Golden-Plover**

Increased numbers of this species were seen during the month of August. As many as 100 were seen on the runway on 22 August 2002.

**15. Wandering Tattler**

Present on the atoll but no conspicuous increase was seen during the month.

**16. Bristle-thighed Curlew**

Numbers of curlews also seemed to increase this month but those numbers seemed to drop by the end of the month..

**17. Ruddy Turnstone**

Present on the atoll.

**e. Raptors**

NTR

**f. Other Migratory Birds**

NTR

**f. Marine Mammals**

Several sighting were noted this month during blue water excursions and are listed below.

DATE	SPECIES	COUNT
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16 August 2002	Melon-Headed Whales	100-200
16 August 2002	Bottlenose Dolphin	20-30
31 August 2002	Spinner Dolphin	?

g. **Fisheries Resources**

A total of 3 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
16 Aug 2002	Yellow Fin tuna	10.77	81.82	
19 Aug 2002	Yellow Fin tuna	10.63	83.82	
21 Aug 2002	Yellow Fin tuna	7.9	76.2	

1. kilograms

2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

h. **Scientific Collection**

Four Red-footed Boobies found dead were sent back to Honolulu this month.

One dead sea turtle hatchling was found on 29 August 2002. It was collected and will be sent back to Honolulu on the next flight.

i. **Animal Control**

The Rat Eradication Program continued through the month. See habitat management.

j. **Marking and Banding**

During the month of August, 3 different species were banded and are listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	10	6
Masked Booby	1	0
Brown Booby	5	0

k. **Disease Control and Prevention**

1. **Oiled Bird Sighting**

NTR

**2. Other**

NTR

**D. PUBLIC USE****a. Visiting Yachts**

Palmyra offers an unusual range of public use opportunities. During the month of August 2 different vessels visited the atoll.

Vessel name	POB	Arrival Date	Depart Date	Registry	Comments
S/V Ola Mai Kai	3	15 Aug 2002	19 Aug 2002	USA	
S/V Mari Cha III	10	24 Aug 2002	26 Aug 2002	USA	

Personnel on both vessels were taken on natural history tours of the lagoon and the outer islands.

**b. Client Groups**

One TNC client group visited the atoll this month arriving on 18 August 2002 and departing on 22 August 2002. Activities include fly fishing for bonefish, snorkeling, blue water fishing and natural history tours. There was an emphasis on tagging bone fish.

**c. Other**

NTR

**d. Law Enforcement**

NTR

**E. EQUIPMENT AND FACILITIES****a. General**

NTR

**b. Communications Systems**

NTR

Report prepared by: C. Depkin

**Palmyra Atoll NWR Monthly Report  
September 2002**

**A. HIGHLIGHTS**

- ◆ On 04 September fishing vessel Pacific Ventures was seen just off the north west reef. They were hailed and informed of the FWS regulations specific to Palmyra and Kingman NWR.
- ◆ On 04 September the remaining long line set was retrieved from the north side of the atoll.
- ◆ On 10 September S/V Wind Drift arrives with 9 POB. They depart on 12 September.
- ◆ On 12 September the purchase agreement was signed that will eventually results in the outer Island of Palmyra transferring to FWS.
- ◆ On 12 September conducted the Red-footed Booby survey. Nesting activity very low.
- ◆ On 13 September a Buff-breasted Sandpiper arrives.
- ◆ On 19 September received news that an area warm water, of higher than average temperature was moving west and was currently surrounding the Northern Line Islands including Palmyra. We started to look for signs of coral bleaching.
- ◆ On 20 September conducted the Red-tailed Tropicbird survey. Nesting activity is low.
- ◆ On 21 September S/V Pisces arrives with 3 POB. They departed on 23 September.
- ◆ Biologist Depkin is planning to depart Palmyra on about 06 October 2002 for an undetermined amount of time.

**B. WEATHER**

Rainfall total for September 2002 was 10.08 inches. Only 2 days was recorded with zero rainfall. Average maximum sun temperature was 34.66°C and the average minimum sun temperature was 25.2°C. Average maximum shade temperature was 31.13°C and the minimum shade temperature was 24.9°C. Wind speed was variable from 3 to 12 KPH and the direction was mostly northeasterly to easterly but on several occasions was southerly and westerly. Average cloud cover during the sample period (between 0800 and

0700) was 51% (range 5-100%). Total rain fall over the past 13 month period was 178.90 inches with only 53 days with no recorded rainfall.

YEAR	MONTH	RAINFALL Inches (*)	MEAN SUN MAX TEMP	MEAN SUN MIN TEMP	MEAN SHADE MAX TEMP	MEAN SHADE MIN TEMP	MEAN <sup>3</sup> WIND DIR	MEAN <sup>3</sup> SPEED	CLOUD <sup>3</sup> COVER
2001	SEP	9.08 (8) <sup>1</sup>	32.7 <sup>2</sup>	24.8	NA	NA	156	4.1	58 (5-100)
2001	OCT	12.14 (10)	34.6	24.3	NA	NA	113	3.2	48 (0-100)
2001	NOV	11.21 (7)	34.4	25	31.3	24.6	118	4.3	71 (10-100)
2001	DEC	17.06 (4)	33.1	24.6	30.7	24.1	63	5.8	59 (10-100)
2002	JAN	17.30 (2)	32	24.5	30.12	23.8	71	4.3	70 (15-100)
2002	FEB	11.62 (3)	32.1	24.3	30.5	23.7	54	5.1	70 (1-100)
2002	MAR	13.03 (3)	32.1	24.5	NA	NA	56	7.3	65 (15-100)
2002	APR	17.38 (5)	33	24.7	30.9	24.5	64	4.5	70 (1-100)
2002	MAY	11.32 (2)	33	24.7	31.2	24	77	3.9	69 (15-100)
2002	JUN	12.7 (2)	33	25	31.3	24.3	73	4	57 (0-100)
2002	JUL	16.98 (4)	33.5	24.6	30.1	24.4	151	2	69 (20-100)
2002	AUG	19 (1)	33.5	25.2	30.3	24.4	104	3.4	76 (15-100)
2002	SEP	10.08 (2)	34.66	25.2	31.13	24.9	115	2.27	51 (5-100)
TOTALS	13	178.9 (53)	33.2	24.7	30.7	24.3	93	4.16	

1. \* = Days with no recorded rainfall.

2. Temperatures reported in degrees C°

3. Wind and cloud cover means are taken from once daily observation.

### C. RESEARCH AND MONITORING

Four shorebird counts were conducted this month. The results are listed below.

DATE	TIME	Pacific Golden- Plover	Bristle- Thighed Curlew	Wandering Tattler	Ruddy Turnstone	Semipalmated Plover	Pectoral Sandpiper	Buff- breasted Sandpiper
06 Sept 2002	0655	49	43	1	12			
13 Sept 2002	0653	53	45	3	3	1	2	
20 Sept 2002	0655	49	47	0	2	0	1	1
27 Sept 2002	0655	50	43	1	5	0	8	1

On 12 Sept 2002 the Red-footed Booby survey was conducted. No new eggs were found and only 54 sites with chicks (39 of which were C9s) were found.

The Red-tailed Tropicbird mean incubation count (MIC) was conducted on 20 September 2002. A total of 3 new sites were found for a total of 14 known active sites.

### D. ADMINISTRATION

#### 1. Personnel

##### a. FWS Personnel

Biologist Depkin was on station the entire month of August.

**b. TNC Personnel**

TNC personnel on island all month were Matt and Elizabeth Lang, John Hill and Chryssi Mitchell.

**FWS Volunteers**

NTR

**c. TNC Volunteers**

Clare Patterson and Chuck and Sally Heath who arrived on 18 August 2002 remained on island through the end of the month.

**d. Others**

NTR

**e. Arrivals and Departures**

On 10 September 2002 – S/V Wind Drift: Arrives with 3 POB. They departed on 12 September 2002.

On 21 September 2002 – S/V ???: Arrives with 3 POB. They depart 23 September 2002.

**HABITAT MANAGEMENT**

**a. Habitat Restoration or Modification**

Several days this month were dedicated to rat lane maintenance. On the Cooper Island Complex this mostly consisted of using a chainsaw and backhoe to cut back and move encroaching vegetation like Scaevola.

On 04 September 2002 the all of the island residents made a trip around the island. We visited the north shore and collected the rest of the long line material that we were unable to collect last month.

**b. Contaminates**

NTR

**c. Bird Aircraft Strike Management**

Groups of pre-breeding Sooty Terns remained through out the month and hazing resumes on the east end of the runway. The number of Sooty Terns dropped to almost nothing by the end of the month and both the use of the play back device and runway hazing have been put on hold.

## **WILDLIFE**

### **a. Endangered and Threatened Species**

On 21 June 2002 and again on 25 June 2002 a total of 3 turtle crawls were found. Two more crawls were found on 16 July and by the end of the month of August one more crawl was found. Crawls were located on North Beach on Cooper Island. On 14 September and again on 19 September 2002 pit #276 and #480 were dug up. The contents of the first contained 42 empty shells, 1 whole egg and 3 partially desiccated eggs. The second pit contained 32 empty shell. Three other crawls were examined but were considered false crawls. Two potential pits remain.

### **b. Marsh and Water Birds**

NTR

### **c. Shorebirds, Gulls, Terns and Allied Species**

#### **1. Wedge-tailed Shearwater**

NTR

#### **2. Red-tailed Tropicbird**

The MIC was conducted for this species this month.

#### **3. White-tailed Tropicbird**

NTR

#### **4. Masked Booby**

NTR

#### **5. Brown Booby**

NTR



**6. Red-footed Booby**

The MIC survey was conducted for this species this month and very little nesting activity was observed. No new nest were found.

**7. Great Frigatebird**

NTR

**8. Lesser Frigatebird**

NTR.

**9. Laughing Gull**

NTR

**10. Sooty Tern**

Still no breeding activity seen for this species except for the near daily aerial activities over the Central Lagoon, the Short Fighter Strip and Cooper Island. Even these activities have been inconsistent in nature where number have ranged from none at all to several thousand birds. No birds were seen on the ground this month.

**11. Brown Noddy**

Present on the atoll. It seems that this species is the only one that uses coconut palms for nesting. Caution will need to be exercised when cutting palms.

**12. Black Noddy**

Present on the atoll.

**13. White Tern**

*Present on the atoll.*

**14. Pacific Golden-Plover**

Increased numbers of this species were seen during the month.

**15. Wandering Tattler**

Present on the atoll but no conspicuous increase was seen during the month.

**16. Bristle-thighed Curlew**

Present on the atoll

**17. Ruddy Turnstone**

Present on the atoll.

**d. Raptors**

NTR

**f. Other Migratory Birds**

Pectoral Sandpipers arrived back on 09 September 2002 and by 22 September there were 8 altogether.

One Semipalmated Plover (id by call) was first seen on 14 September 2002 on the runway.

One Short-billed Dowitcher (id by call) was seen on the runway on 14 September 2002 and one day later on the flats of the Milky Way.

One Buff-breasted Sandpiper was seen on 13 September 2002 and remained through the month.

One Solitary Sandpiper (id from plumage) was seen on 22 September 2002 and was seen for several days after.

Three Northern Pintails were seen on 25 September 2002 flying with 3 curlews over Barren Island.

One Cattle Egret was seen along the North/South Causeway on 09 Sept 2002. It was seen several time through out the month.

**e. Marine Mammals**

Several sighting were noted this month during blue water excursions and are listed below.

DATE	SPECIES	COUNT
04 Sept 2002	Bottlenose Dolphin	25 (3 groups)
04 Sept 2002	Melon-headed Whales	150+
13 Sept 2002	Bottlenose Dolphin	10

13 Sept 2002	Spinner Dolphins	100+
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f. **Fisheries Resources**

A total of 4 pelagic fish were caught and retained this month during blue water fishing activities.

DATE	SPECIES	MASS <sup>1</sup>	LENGTH <sup>2</sup>	NOTES
04 Sept 2002	Ono	6.4	104	
04 Sept 2002	Ono	4.45	98	
13 Sept 2002	Yellow Fin tuna	5.27	67	
13 Sept 2002	Yellow Fin tuna	11	89	

1. kilograms

2. centimeters, from the tip of the nose along the mid line to the fork of the tail.

g. **Scientific Collection**

NTR

h. **Animal Control**

The Rat Eradication Program continued through the month. See habitat management.

i. **Marking and Banding**

During the month of August, 1 species was banded and is listed below.

SPECIES	LOCALS	ADULTS
Red-tailed Tropicbird	11	0

j. **Disease Control and Prevention**

1. **Oiled Bird Sighting**

NTR

2. **Other**

NTR

**D. PUBLIC USE**

**a. Visiting Yachts**

Palmyra offers an unusual range of public use opportunities. During the month of September 2 different vessels visited the atoll.

Vessel name	POB	Arrival Date	Depart Date	Registry	Comments
S/V Wind Drift	9	10 Sept 2002	12 Sept 2002	USA	
S/V Pisces	3	21 Sept 2002	23 Sept 2002	USA	

Personnel on both vessels were taken on natural history tours of the lagoon and the outer islands.

**b. Client Groups**

NTR

**c. Other**

NTR

**d. Law Enforcement**

On 04 September 2002 around 1230hr. a fishing vessel was seen close (less than a quarter mile) to the reef to the north and west of the atoll. They were contacted on VHF 16 and were informed of the name of both the vessel and the captain (vessel Pacific Ventures, Captain Russel Furten). The vessel was a USA registered squid boat. The captain was informed about the presence of the NWR and the 12 mile no fish limit both here and at Kingman's Reef. The Captain indicated that he was aware of this limit. When asked what the vessel was doing so close to the reef the Captain's response was that they were conducting drills (MOB, fire, et.). Soon after our radio conversation the vessel departed the area. No other commercial vessels were seen or contacted.

**E. EQUIPMENT AND FACILITIES****a. General**

NTR

**b. Communications Systems**

NTR

Report prepared by: C. Depkin